PROFESSIONAL ENGINEER

Official Publication of American Association of Engineers

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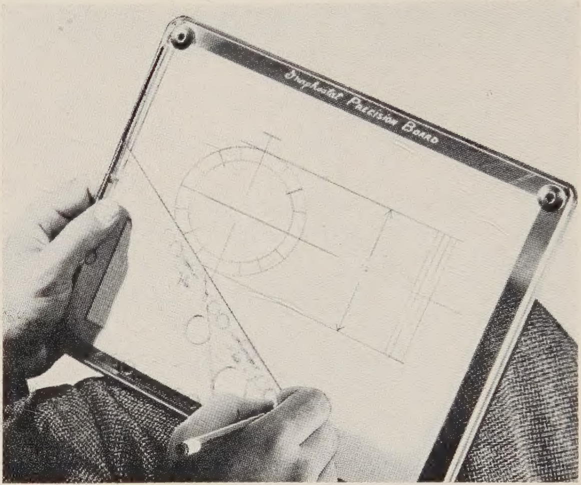
Group honoring the 1000th person (Mrs. Virginia F. Sabo) to receive a Civil Engineering degree at Missouri School of Mines and Metallurgy, at the 1952 Commencement. Left to right: Joe B. Butler, Professor and Chairman, Dept. of C.E., Leon Hershkowitz, Asst. Prof., C.E. Representing the Alumni, Virginia F. Sabo, recipient of 1000th Civil Engineering degree from M.S.M., Dr. Curtis L. Wilson, Dean of the Missouri School of Mines and Metallurgy, Rolla, Mo.

l. 37 No. 2



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M. E. McIVER, Editor

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THE CENTENNIAL OF ENGINEERING

First Day Cover

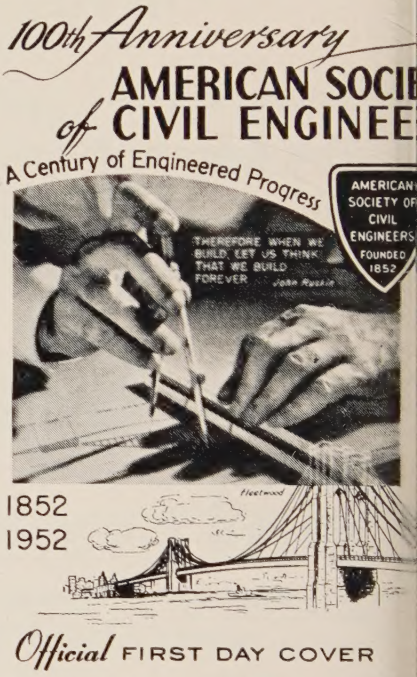
As a matter of record, we reproduce the official design engraved on the first-day cover bearing the Commemorative postage stamp celebrating the 100th anniversary of the American Society of Civil Engineers, and a century of engineering progress.

The symbolic design officially selected and engraved on the first day cover is of unique human interest. It is a photographic study showing the hands of an engineer working with engineering instruments on the plans for a suspension bridge. Below the photograph is a perspective drawing of the Brooklyn Bridge, and above the hands is the quotation from John Ruskin: "Therefore when we build, let us think that we build forever."

The hands shown are those of David B. Steinman, internationally known bridge engineer. The bridge design on which his hands are shown at work with his drawing instruments is that of his dream bridge—his proposed bridge across the Narrows at the entrance to New York Harbor, between Brooklyn and Staten Island, which is planned to be the greatest and most beautiful span in the world. The clear span from shore to shore will be 4620 feet—a thousand feet longer than the George Washington span. The Brooklyn Bridge, shown in the perspective sketch at the base of the engraving, is the bridge that inspired David Steinman in his youth and which has recently come back to him, at the height of his career, for reconstruction to increase its traffic capacity for modern requirements. The Ruskin quotation at the top has become identified with Dr. Steinman as his personal motto and has become familiar to his audiences and his readers in his inspirational addresses and writings around the world.

The photographic study of Dr. Steinman's hands at work on plans for the great span over the Narrows was made by Frank H. Bauer for his book on the hands of outstanding representatives of the various arts and professions.

Dr. Steinman admits that he is thrilled by the conception and adoption of this design for the official first-day covers. "A half-century ago, when I was a boy on the streets of New York," he said, "I never dreamed that my hands, my work, and my inspiration would some day become the symbolic theme of a century of engineering progress in America. Only in America can such things come true."


100th Anniversary
AMERICAN SOCI
of CIVIL ENGINEE
A Century of Engineered Progress
AMERICAN SOCIETY OF CIVIL ENGINEERS FOUNDED 1852
THEREFORE WHEN WE BUILD, LET US THINK THAT WE BUILD FOREVER John Ruskin
Fleetwood
1852
1952
Official FIRST DAY COVER

Officials of the American Society of Civil Engineers, celebrating the centennial of the founding of that organization as the first national engineering society in America, said they were glad to adopt the design honoring Dr. Steinman as a tribute to his achievements and in recognition of all he has done through a lifetime to aid his fellow engineers and to inspire younger men.

The American Association of Engineers is deeply pleased to have one of its Life Members and a former national president so honored.

Down the Years It's Been Service

Patrick J. Lucey, President, A.A.E.

esidential address opening the 1952 convention of the Association, held at the Lake Shore Club, Chicago, Illinois on September 2 and 3.

THIRTY-SIX years have come and gone since the inception of the merican Association of Engineers, created to serve the profession in e field of professional welfare. Many outstanding engineers have steered e ship on its unchartered course.

Eminent engineers were quick to give the youthful founders unquali- ed support in those early years. They realized these young men were ncere, blessed with determination and vision, but inexperienced. Youth t the goal; the more conservative engineers furnished the leadership. l realized the importance of a national society that would serve both e public and the individual members of the profession.

Paramount in the minds of these engineers, both young and old, as UNITY in the engineering profession. Immediately they set about do something about it.

"Service to the members and efficiency in performing such services" s the keynote of the Conference on Co-operation held in 1916, 1917 d 1918, under the auspices of A.A.E. The leader in this movement was e late Dr. Frederick H. Newell, at that time Professor of Civil Engi- ering, at the University of Illinois, and in later years affectionately own as the "father" of the U. S. Reclamation Service.

Dr. Newell had for a number of years advocated the formation of all-inclusive body uniting all kinds of technical men for the protection professional standards and the improvement of engineering remuner- on. When he joined A.A.E., he brought with him the experience of eral years' efforts to effect closer cooperation among existing engi- ring societies.

The mechanism through which he had worked was the Committee Engineering Co-operation which had held annual conferences of repre- tatives of technical societies and related engineering groups. Its poses were identical with those adopted by A.A.E. and because Dr. vell felt that a separate organization dedicated to the social and nomic improvement of the engineer, in other words, "human engi- ring" was necessary, he threw his support to the American Association Engineers, and became its president in 1919.

"Organizations are much like individuals," said President Newell. individual can grow unless he serves. No community can grow eco- nically, socially, morally or ethically unless it is aroused to the need Service.

"The one thing in which an organization differs from a human g is that it has nearly unlimited life and strength. It is not merely a collection of individuals—it is more than this; an artificial entity removed from many of the limitations of the ordinary man. It starts out with infantile vigor and grows in strength and size. It has certain infantile dangers and diseases and if it passes safely through these, gradually reaches a maturity of judgment and wisdom which is characteristic of a mature age. After growth and experience, there is usually acquired a wisdom which theoretically, at least, surpasses that of the individual."

Many services were inaugurated during those early years and others added as conditions warranted. Always uppermost in the minds of the leaders was the fact that the Association must serve to live. The late Harry O. Garman made this plan in his presidential address at Salt Lake City Convention in 1922, when he said:

"The only lasting treasure we have is the service performed for another. The highest reward of service is perhaps the privilege of having been of service.

"Any individual or institution that serves a public need will survive, and so if the American Association of Engineers will more and more make it its business to be of service to the individual engineer, and to society, and to the public, the future welfare of the organization is assured and its activities may be counted among the assets of our national development."

And so we find as we look over the history of A.A.E. and talk with those who have been closely identified with the Association that services of a thousand different kinds have been rendered to members throughout the years in and out of the line of duty, many strictly confidential, and on every imaginable subject. Many engineers have contributed generously in our work but I would be remiss in this report if I did not mention in particular the valuable work done by one of our Past Presidents, Herman A. Wagner, who has devoted many years to Association activities. He has willingly and most efficiently "taken over" this particular activity of the Association, devoting many hours a day to the problems, trials and tribulations of the individual engineer—professional—business—social—economic—domestic. He is never too busy to listen; never too preoccupied to serve; always willing to give advice and information when asked. He too joined the Association, way back in 1921, because it offered him an opportunity to serve his fellow engineers. Every member of the Association owes him a vote of thanks for many years of faithful service—performed to advance an Ideal.

If we will take the time to thumb through the pages of Professional Engineer during the past thirty-six years, we will find every issue devoted to some sort of service that has been performed by the Association, either for the individual, the profession, for industry or the public.

You are all rather well acquainted with these services, or activities and I shall not dwell on them, except to say that all of them have promoted the social and economic interests of professional engineers . . . registration . . . personal efficiency . . . employment . . . insurance . . .

ublic relations . . . civic consciousness . . . unity in the profession.
The Association has a long list of accomplishments, there is still great
eed for more and more work in these fields.

In 1952 we established the A.A.E. Gold Key, beautifully designed
y a Chicago Chapter member, Walter R. Kostner. It is symbolic of the
ork done by A.A.E. throughout the years.

The Engineers' Memorial Building is another new project actively
egun during the time Edmund J. Fitzmaurice was president. We have
good start and hope to get the project under way in good order before
ery long. It will be another *first* in the Association's long list of firsts
. . a long list of accomplishments in the field of professional welfare.
.A.E. always dared to step out in the open and fight for the Engineer
. . It is the "father of the Registration movement." It fought for regis-
ation when it was bitterly opposed by all other existing engineering
ocieties. Its efforts were highly successful. It fought for better employ-
ent conditions . . . for better recognition . . . for unity in the profession
. . for broader engineering education . . . for adequate compensation in
oportion to responsibilities carried . . . for ethics in the profession,
fact adopted the first Code of Ethics for Engineers.

The Association has from its very inception believed that the Engi-
eer must be free, he must be free to use his talents for the best interests
Society. He must be uncontrolled by outside forces. Upon him rests
e salvation of the Country, yes the World. On the other hand, he must
respected, adequately rewarded, and encouraged. The Engineer stands
the man between capital and labor. Full employment depends upon
aximum production, and to that end private enterprise must make
llest and most efficient use of the knowledge and skill of technically
ained men. And because that is so true, the American Association of
ngineers believes that there should be greater unity of thought and
tion on the part of all professional engineering and scientific societies,
that they can act intelligently, efficiently, and in unison to protect
ciety and industry from political blundering and unwise and costly
perimentation. In the Centennial of Engineering we have made a good
art toward better public relations. The public . . . at least the people
Chicago . . . will know more about the Engineer, more about who he
and what he does, than they ever did before. Thanks to the united
ort of 59 engineering and scientific societies!

Greater public recognition for the Engineering profession has always
en one of the activities of A.A.E. It is a plank in its platform . . . let's
t change it . . . Let's *make it work.*

Yes, A.A.E. has reached maturity; it has made mistakes, but it and
other engineering societies interested in the welfare of their members,
ve profited thereby. The Association's activities and its many years
experience have been most helpful and beneficial in the field of pro-
sional welfare. According to the philosophy of Dr. Newell, A.A.E.

has "acquired a wisdom which theoretically, at least, surpasses that o the individual."

To the incoming Board of Directors, I would suggest

1. A continuation of the major planks in the A.A.E. platform.

2. A campaign to enlarge the scope of our activities to better service the Engineer, Industry and the Public.

And to the members of the Association I would leave this thought

1. Appreciate with all the power you have the fact that we live in a country where we may band together to advance our own professiona and social interests . . . KEEP all of your independent, uncontrolled and self-supporting Democratic institutions including engineering and scientific societies in good working condition. This is a heritage we must preserve.

2. Be active . . . be interested . . . be cooperative.

Guests of I.M. & C. at Entrance of Skokie Laboratories

This picture depicts the opening of the new laboratories of the International Minerals & Chemical Corporation on June 25th. This preview was by invitation and was attended by H. A. Wagner and Peter L. Loewe, representing "Professional Engineer" and the American Association of Engineers, respectively.

The laboratories are located in Skokie, Illinois, and are of the most modern construction, and the equipment is of the latest design.

The company graciously furnished guides and all questions were answered without reservations.

After the ceremonies were over, dinner was served at Landers Restaurant, enabling the visitors to become better acquainted. Those that attended the opening of the new laboratories will always remember the hospitality of the International Minerals & Chemical Corporation. Mr. Wagner is fourth from the left in the first row and Mr. Loewe, fifth.

Virginia Sabo Honored

Rolla School of Mines has always had a place in the heart of the merican Association of Engineers. First, because of its fine reputaion and the many outstanding engineers who have been graduated; econdly because of our deep respect and high regard for Joe Butler, ho joined the Association in 1918. Mr. Butler is now Professor and hairman, Department of Civil Engineering at Rolla.

On May 26, 1952, Virginia Sabo was honored at the commencement t the Missouri School of Mines because she was the thousandth person receive the First Degree in Civil Engineering from the school. In ecognition of this distinction she received a one year's free Junior embership in the American Association of Engineers.

Mrs. Sabo was born in Salt Lake City, Utah. She received her rly education in grade schools and high schools throughout the west hile traveling with her father, John Berg, a construction engineer. he entered Pasadena City College, California, in 1939, working nights the engineering department of National Technical Laboratories. In 42 she joined the Army Air Force, and saw duty with both intelligence d engineering units and took part in the Aleutian Island campaign. he was discharged in 1945.

While in service Virginia met and married Eugene L. Sabo, and ter his discharge in 1946 they entered Missouri School of Mines. Mr. bo was graduated in 1951 and Virginia in 1952, finishing in the upper % of her graduating class, as the 1,000th graduate in C.E.

Furthermore, she was the only member of her sex in the class. She a member of Chi Epsilon, honorary civil engineering fraternity, and i Kappa Phi, scholarship society. She has received the gold and the ver scholarship keys and was an active member of the student chapr of A.S.C.E.

Mrs. Sabo has been employed with Geodetic Computation Section Topographic Division of U.S.G.S. in Rolla since completing her work r graduation in January, 1952.

At the annual banquet of A.A.E. held in Chicago on September 3, 52, Dr. H. A. Wagner spoke of Mrs. Sabo's fine record, and welcomed r to membership. "It just so happens," he said, "that Virginia Sabo s just been elected to membership. We welcome her with open arms. ow times have changed! A woman engineer was almost unheard of en the fine young men founded the American Association of Engiers 36 years ago. Today we find them in all branches of the profession, lding their own with their fellowmen.

"How fittingly then it is that we bid welcome to a young lady, our st recent member, and at the same time honor the man who has the distinction of holding the longest, continuous membership in A.A.E., W. W. DeBerard, the finest city engineer the City of Chicago ever had. Mr. DeBerard was the 25th Engineer to join the Association in June, 1915, a founder, a pioneer, an outstanding engineer, and a loyal member throughout the years."

Virginia Sabo is, indeed, a credit to Missouri School of Mines, and an inspiration as well to the young people of today, who seek a career and are willing to work for it. On the other hand, Mrs. Sabo can certainly be proud of her Alma Mater. All of the Engineering Curricula at the school are fully accredited by the Engineers' Council for Professional Development. We list the total number of first degrees granted by the Missouri School of Mines at the end of its regular commencement in 1952: Mining Engineering, 1,611; Civil Engineering, 1,014; Mechanical Engineering, 851; Electrical Engineering, 721; Metallurgical Engineering, 648; Chemical Engineering, 613; Science, 214; Ceramic Engineering, 201. Total first degrees, 5,873.

Public Relations In Engineering

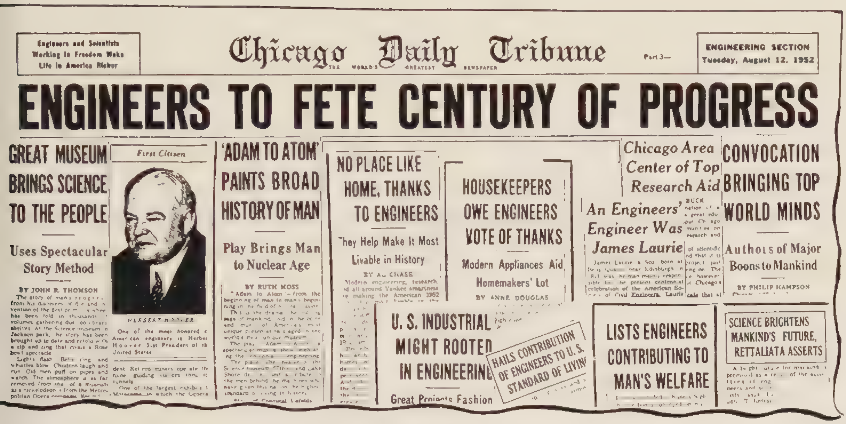
The Chicago Tribune gives the Engineering profession the first real publicity depicting the work and contributions of Engineers in its special "Engineering Section," issued on August 12, 1952.

"Engineers and Scientists Working in Freedom Make Life in America Richer," is the Tribune's tribute to Engineers.

PUBLIC Relations and the Engineering Profession was one of the subjects discussed during the panel session on the second day of the convention. The delegates expressed themselves as highly pleased with the splendid publicity given the Centennial of Engineering by the Chicago Tribune, in advance of the convocation. In substance, the following story shows the need for good engineering public relations, and the convention's appreciation of the excellent and highly beneficial publicity given the engineering profession and its thousands of members by the Chicago Tribune.

If it were possible to award the Clausen Medal to an institution rather than to an individual, as the rules prescribe, there is little doubt that the Chicago Tribune would receive the medal this year. The Clausen Medal is bestowed by American Association of Engineers upon an individual who signally contributes to the improvement of the social and economic status of engineers.

The Chicago Tribune has rendered a distinct service to the profession in the field of public relations by publishing on August 12, 1952, a 20-page Engineering Section heralding the Engineering Centennial to be held in Chicago, September 3rd to 13th, 1952, which, with utmost skill reveals the human side of engineering, the part that science and engineering play in the lives of people.



Engineers and Scientists Working In Freedom Make Life In America Richer

Chicago Daily Tribune
THE WORLD'S GREATEST NEWSPAPER

Part 3—

ENGINEERING SECTION
Tuesday, August 12, 1952

ENGINEERS TO FETE CENTURY OF PROGRESS

GREAT MUSEUM BRINGS SCIENCE TO THE PEOPLE

Uses Spectacular Story Method

BY JOHN R. THOMSON

First Citizen

HERBERT HOOVER

One of the most honored American engineers is Herbert Hoover, 31st President of the United States.

'ADAM TO ATOM' PAINTS BROAD HISTORY OF MAN

Play Brings Man to Nuclear Age

BY RUTH MOSS

NO PLACE LIKE HOME, THANKS TO ENGINEERS

They Help Make It Most Livable in History

BY AL CHASE

HOUSEKEEPERS OWE ENGINEERS VOTE OF THANKS

Modern Appliances Aid Homemakers' Lot

BY ANNE DOUGLAS

Chicago Area Center of Top Research Aid

An Engineers' Engineer Was James Laurie

CONVOCATION BRINGING TOP WORLD MINDS

Authors of Major Boons to Mankind

BY PHILIP HAMPSON

U. S. INDUSTRIAL MIGHT ROOTED IN ENGINEERING

Great Projects Fashion

HAILS CONTRIBUTION OF ENGINEERS TO U. S. STANDARD OF LIVING

LISTS ENGINEERS CONTRIBUTING TO MAN'S WELFARE

SCIENCE BRIGHTENS MANKIND'S FUTURE, RETTALIATA ASSERTS

Engineering societies which have for years decried the profession's ck of "recognition" and struggled to achieve it, may well agree with e adage that "the first hundred years are the hardest," as they happily ntemplate the well nigh perfect public relations job done by the hicago Tribune.

"Engineers and Scientists," a box on the front page proclaims, Working in Freedom Make Life in America Richer." Every caption, ery story in the section illustrates this theme and tells people in raight-forward, forceful, exciting language (not technical jargon) just hat engineers are doing for them to take drudgery out of their lives, to sure their safety, give them jobs, and otherwise advance their welfare. ere is a typical statement, quoted verbatim from one of the stories:

. . . Writers on science subjects hold up bright promises of the essings to mankind that may be expected as the atomic structure rises.

However, the old line engineers, aided by the slide rule and blue-int boys working in anonymity have long since proved their ability. he boons they already have conferred upon mankind are attested to by e millions of Americans riding from coast to coast in machines made 15,000 parts, by the streamlined speedsters of the rails, and 300-mile-hour and faster passenger planes.

The engineers have made the word drudgery meaningless in millions homes, countless factories and offices, and on thousands of farms.

Thirty-five years ago, the American Association of Engineers faced is problem of "recognition" and retained experts to tutor its chapters publicity methods. They worked on the theory that engineers would ceive better pay and greater respect and affection from the public when ople understood the social contribution made by engineers.

It was also believed that engineers should at least share honors with liticians in the naming of great public works projects. (The Chicago ibune, with picture and caption, has memoralized one case which particularly annoyed engineers—the renaming of Hoover Dam as "Boulder Dam.")

A great deal of the energy of public relations committee during this period was devoted to "defending the title, 'engineer' " and campaigning for a "Public Works Department" in the President's cabinet. The slogan, "engineers in engineering jobs" was also a public relations objective. Most of the reams of copy that emanated from engineering societies in these days, however, was made up of "proceedings," tiresome details of meetings, and flattering biographies of society officers. A great deal of it could appropriately have been filed in the "Who cares?" folder—so little did it interest the public or affect its attitude toward engineers.

In 1935, American Association of Engineers re-appraised its public relations program, and the next year announced its findings. The Association's researchists discovered that the publicity output of the combined societies was much less copious, colorful, and effective than the output of other agencies over which the societies had no control. Movies, short stories, and novels, they found, glamorized engineers, representing them as incorruptible and practically indestructible, always battling the force of evil and the elements in dramatic situations.

These engineers were not at all typical of the thousands of trained conscientious, capable men in prosaic jobs who were society's real benefactors. To a lesser degree this was true also of engineering in the newspapers, radio commentary, and magazine features. Only a few types o enterprises feature engineers or engineering in their advertisements Engineering was emphasized as an important factor in production o automobiles and electric appliances used in the home. There was, however a proprietary note in these advertisements which suggested that engineers were assets of technological organizations, accessories to progress rather than purposeful contributors to public welfare. In its report, American Association of Engineers reminded engineers that:

> A silkworm makes a contribution to society that is unique, but can be credited with no love of mankind, no social purpose. Engineers may invest, design, construct, and still, like the silkworm, be considered mere accessories to the progress of civilization, not leaders. Engineers must not allow themselves to be identified with the mechanical phase of their work and disassociated from its social effects.

The Chicago Tribune has not pictured engineers as supermen or magicians, but as humanitarians. This is good. The profession will benefit more from affection than from awe.

When you eat and sleep, walk and ride, work and play, you are quite unconsciously dependent on engineers for your safety and comfort and convenience. Yet in these intimate relations engineers are "unseen values."

*How Bridges Have Increased Man's Mobility**

By D. B. Steinman
Consulting Engineer, Life Member A.A.E.

The past century has seen the transformation of America—from a young pioneer settlement to a great and flourishing nation, taking its place in the leadership of the world.

In the shrinking of distances and speeding of travel, bridges have played an indispensable role. The nation has become more closely knit together. Remoteness and isolation have been replaced by unity and mobility.

America has been transformed into a nation on wheels. We now have fifty million motor vehicles rolling over our paved roads, parkways, bridges, and express highways. The luxuries of yesterday have become the necessities of today.

How has this transformation been accomplished?

America and its greatness have been built by the courage of the pioneer, the spirit of individual and concerted enterprise, and the grit and resourcefulness of the engineer.

We hear much of the "Four Freedoms," but in all of this talk we are in danger of losing sight of the Four Freedoms on which this Nation was founded and on which it achieved its greatness. They are: Freedom of Vision, Freedom of Enterprise, Freedom of Incentive, and Freedom of Achievement.

These four freedoms spell America. They also explain much of the success we have had in developing a transportation system that involved the building of many of the world's greatest bridges.

The early settlers were limited in mobility to footpath, pack trail, and local wagon road. And then, in succession, came the building of canals, railroads, and modern highways. Each of these in turn required bridges, and each depended upon the bridgebuilder's art for feasibility and realization. The American spirit—at once daring and practical—is peculiarly adapted to excel in this development.

Since about 1920, the phenomenal development of highway traffic has created a new phase of bridge construction in which there is both the need and the economic justification for bridges of unprecedentel dimensions over crossings that previously had to be left unspanned, as well as the need for tens of thousands of smaller bridges.

There are over 90,000 steel bridges on 240,000 miles of railroad in

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*Presented at the Centennial of Engineering, Structures and Construction Convocation, September 8, 1952

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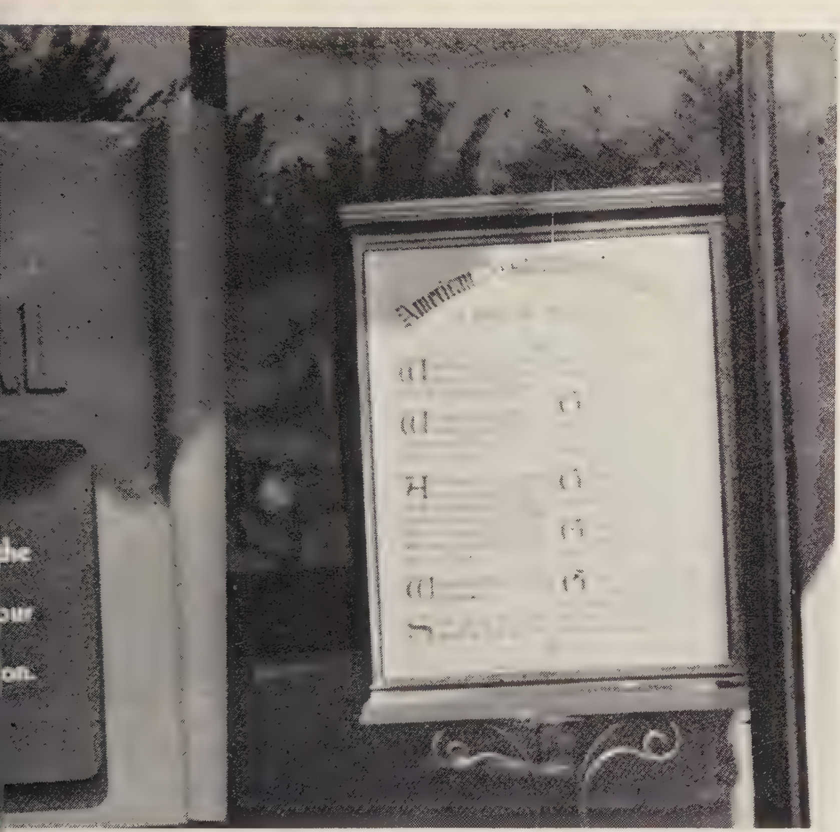

I.B.M.—A.A.E. Centennial Window

photograph of the Centennial of Engineering window of the al Business Machines. I.B.M. offices are located just a few steps the Conrad Hilton and the Blackstone Hotels, both of which ge number of the delegates to the Centennial. Most graciously, d A.A.E. one of its windows for the display and through the Dr. Earl C. Webb, Chief Engineer, American Bridge Company, and Albert P. Boysen, Division Engineer, American Bridge Chicago, a model of a bascule bridge was furnished. The Enw of Service, American Association of Engineers, enlarged ully framed, with appropriate bridge photographs as a background sented a truly Engineering Display.

the U. S. But the number of highway bridges, both steel and concrete, exceeds 250,000 on the 3,000,000 miles of roads and highways. The aggregate investment in these highway bridges is over $3,000,000,000.

Cities located at junctions of rivers are particularly dependent upon bridges for their development, and thereafter for the mobility of their population. The city of Pittsburgh has sixteen highway bridges and seven railroad bridges spanning the Allegheny and Monongahela rivers. In New York City, in a single day, over 750,000 automobiles and trucks cross the fifteen highway bridges entering Manhattan Island, besides over 700,000 passengers daily on rapid transit trains and electric trolly cars.

Individual bridges have proved of tremendous importance as the key factors in the development of cities, regions, and the nation as a whole. The Eads Bridge over the Mississippi River at St. Louis, completed in 1874, was the essential link in the development of the transcontinental railroad system. At the same time, it was of prime importance in the development of St. Louis, establishing it as a focal railroad crossing and as one of the most important cities on the Mississippi.

Probably no bridge had more influence on the growth of a city than the Brooklyn Bridge, leading to the new-formed city of Greater New York. The additional East River bridges, which soon had to be built in quick succession, completed the transformation of making Brooklyn the largest borough of the enlarged metropolis and of creating the new great borough of Queens.

The seven longest spans in the world are in the U. S. They are: Golden Gate, 4200 ft.; George Washington, 3500 ft.; Tacoma Narrows, 2800 ft.; Transbay, 2310 ft.; Bronx-Whitestone, 2300 ft.; Delaware Memorial at Wilmington, 2150 ft.; and Detroit-Ambassador bridge, 1850 ft. All of these are of the suspension type, and all are highway toll bridges.

The largest bridge project in the world consummated to date is the Transbay Bridge between San Francisco and Oakland, a crossing eight miles long, completed in 1936, costing over $77,000,000. A record foundation depth of 240 feet was reached for one of the piers.

The world's longest span is the Golden Gate Bridge, also at San Francisco, completed in 1937 at a cost of $35,000,000. The main span, 220 feet above the water, is 4200 feet between towers 746 feet high.

The George Washington Bridge, spanning the Hudson River at New York, with a main span of 3500 feet, was opened in 1931 at an initial cost of $60,000,000.

With wider and more numerous crossings required, the bridgebuilders of America have achieved and retained the leadership in almost every modern type of bridge, including not only the unrivaled suspension bridges, but also the world's longest spans in cantilevers, steel arches, continuous trusses, simple trusses, timber spans, swing spans, vertical ft spans, bascule spans, and transporter bridges.

Bridges are an index of civilization. With the expanding needs of
nter-communication and travel and with the advances in technical
ience and constructive skill, the development of bridges has been
arked by a rapidly accelerated tempo of progress. The past century
as encompassed more advance in the science and art of bridge-building
an all the preceding centuries, and the past generation has again more
an doubled that record in the attainment of still greater and bolder
ans.

Never before in the history of bridge engineering have such amazing
rides of progress been recorded. Length of span is one of the measures
y which bridges are judged, since it provides a convenient over-all index
f related advances in the art, including improvements in design, theory,
onomics, new materials, new bridge types, and methods of erection.

Bridges of still greater span-length and magnitude are already in
e planning stage. The writer in fact has designed bridges for proposed
cations over the Narrows at New York and over the Strait of Messina
Italy with spans of 4620 and 5000 feet, respectively. A generation ago,
e feasibility of a span of 3000 feet was seriously questioned. Now we
an state with confidence that suspension bridge spans up to 10,000 feet
e practicable and may be expected.

As the result of progress in the science and art of foundation design
d construction, new records have been achieved in the magnitude and
pth of bridge foundations sunk under the most difficult conditions.

Development of longer-span bridges has created an impelling need
r improved bridge materials. This has taken two directions: one, the
velopment of higher-strength steels, and the other, the development of
hter-weight metals for structural use. The economy of utilizing
ronger or lighter metals increases with the span-length.

The principal lightweight material has been structural aluminum.
nce 1932, aluminum has been applied in the construction of several
table bridges in the United States, England, and Canada, as well as
military bridges. New possibilities have thus been opened in the
ture attainment of longer spans.

During the past 25 years, new attention has been concentrated on the
ainment of beauty in bridges. Annual Artistic Bridge Awards, in-
gurated in the United States in 1928, have focused attention on the
portance of making bridges beautiful. New goals of artistic bridge
sign have been achieved through beauty and harmony of composition,
ough beauty of line, form and proportions, through color and illumi-
tion.

To build their famous aqueducts, the ancient Romans used thousands
tons of masonry in massive piers and arches to carry a small conduit

for water supply. Today graceful, airy spans, in seeming magic, carry thousands of tons of useful load.

Ponderous proportions are no longer the visual expression of power.

People have to live with the structures we build. Our work becomes a part of the landscape, to mar or to grace. If we are to be true to our trust, each structure we raise and each span we build must be a thing of uplift and inspiration.

The rainbow spans of tomorrow will have simplicity of form, beauty of line, grace of proportion, harmony of color, and radiant illumination.

I think that no one, unless he is completely without feeling, can remain unmoved at the sight of a beautiful bridge. In span after span, bridge designers have now demonstrated that beauty can be secured without sacrificing utility or economy.

The bridge designer of this era has to be both engineer and artist combined. To a thorough understanding of structural design and function he must add a strong feeling, both innate and trained, for beauty of form, line, and proportion.

In addition to beauty of form and line, the graceful arching spans of tomorrow, like their rainbow prototype, will have brightness and warmth of color. Instead of a black or gray intrusion or disfiguration the span of tomorrow will be a thrilling part of the colorful landscape At night the rainbow span will be an arc of radiant glow.

Through the ages, the spirit of the bridgebuilder has been:

"From dream to deed—from vision to accomplishment."

That has been the spirit of the engineering profession.

It has likewise been the spirit of America.

The bridgebuilders who preceded us dreamed their dreams and wrought their dreams, giving health, strength and even life itself as the price of achievement. This generation is profiting by the work of the pioneers and is tackling even greater tasks. Whatever we may accomplish will in turn be eclipsed by those who follow us.

In our large cities and over our mighty rivers we see great bridges, beautiful bridges, bridges that inspire us and stir our imagination. The souls of men have been poured into their creation.

That is the spirit of dedication of the bridgebuilder. This spirit is expressed in the words of John Ruskin:

"Therefore when we build let us think that we build forever."

A bridge is not only a stepping stone of civilization. It is also a symbol of unity, the embodiment of the aspirations of humanity.

THE 37TH ANNUAL MEETING OF A.A.E.

We will give the members a brief picture and report of the meeting held during the Centennial of Engineering in the next issue of Professional Engineer, to be mailed in November.

An Arch of Faith

By Ruth Ann Paschke

Iow best can we pay tribute to
A man so noble, . . . fine?
Ie's reached your hearts in many ways
Just as he has touched mine!

Ie's bridged the life of others . . .
through
His works, . . . each thoughtful deed
estowed on . . . someone passing by
Who seemed so much in need.

f a lift up . . . life's ladder . . . in
The battle, toil of day,
id this not prove his greatness in
An engineering way?

or, the life that's made better through
The touch of kindly heart
Vill feel atune . . . with something
that
Proves much of God . . . a part!

nd, the lessons he has given
Deep from his wondrous mind
ave builded lasting structures that
Will better . . . all mankind!

r man must be as sturdy as
The bridges . . . he may make,
e must build in mind and body
No short-cuts ever take!

ke steel and iron or concrete, we
Must make of life our best,
e engineer has proven how
It pays to stand life's test!

ch heart has grown the richer for
Touching upon life's way . . .
e wondrous heart we honor . . . in
Deep gratitude today!

Century of Progress . . . has
Befell his life to view
has mastered all the old tasks.
With faith he greets the new!

And, like the Master's handiwork
He's built for you and me
An arch of faith . . . forevermore,
To stand . . . eternally!

Dedicated to: Dr. Herman Alexander Wagner, for his outstanding achievement in the Field of Engineering and expressing the Hearts of all who have known, revered and loved him through his many years of Service with the American Association of Engineers.

This appropriate poem, beautifully hand-lettered by Charles R. Monroe, in attractive frame, was presented to Dr. Wagner at the Annual Convention of A.A.E., held in conjunction with the Centennial of Engineering on Sept. 3, 1952. Mr. Monroe is the husband of Ruth Ann Paschke, and has been a member of the Association for many years. He became acquainted with Dr. Wagner when living in Chicago.

Dr. Wagner has given many years to the individual social, business and professional problems of engineers, both young and old. Never a day goes by that some engineer is not found at National Headquarters in consultation with Herman Wagner. He is a Consulting Mining and Metallurgical Engineer, received his mining engineering degree from the Mining Academy of Freiberg and his Ph.D. from Heidelberg. He has been engaged in the practice of mining engineering and mine operations on all five continents, has developed many processes for the treatment of refractory ores and has numerous patents to his credit. He is a member of the A.I.M.&M.E., A.I.E.E., and many other technical societies, but his chief interest, his "hobby," so to speak, is carrying forward one of the major activities of A.A.E., "Service to Engineers." In this capacity he has done a tremendous job, first because his wide experience and contact with engineers all over the world, has given him the necessary knowledge and understanding; secondly, his heart is with the engineer; thirdly, he believes in A.A.E., in the aims and ideals of the men who founded the Association so many years ago.

Mr. and Mrs. Monroe chose to pay tribute to Dr. Wagner's interest in them and the many hundreds of other engineers, by the poem entitled, "An Arch of Faith."

31st Annual Meeting NCSBEE

The 31st annual meeting of the National Council of State Boards of Engineering Examiners was held at Colorado Springs, Colo., in The Antlers Hotel, on Sept. 4, 5 and 6, 1952.

Official representative of AAE was Francis F. Seeburger III, Western Manager of Railroad Accessories Corporation of New York, of Denver, Colo.

San Bernardino

The Oct. 15 meeting of the Chapter was held at the cafeteria, San Bernardino Valley College. The subject was "Registration for Engineers and Surveyors," and the speakers included members of the Board of Registration for Civil & Professional Engineers, Paul E. Jeffers, George L. Sullivan, William A. White, Asa G. Proctor, K. M. K. Boelter, Royal W. Sorensen and W. H. Geis.

Illinois Engineering Council

The third meeting of the I.E.C. Executive Committee for 1952 was held on Sept. 13 in the rooms of the Western Society of Engineers. H. A. Wagner represented the American Association of Engineers and was appointed a member of the committee on the Economic Status of the Engineer.

The Legislature Committee reported, through J. F. Sullivan, Jr., that the committee was following the recommendations of the Plumbing Commission, who are to report at the next session of the Legislature and was studying the new Plumbing License Law and the Boiler Safety Act. These bills were enacted during the 1951 session of the Legislature. The committee is also following the Rules of Regulations as formulated under the Boiler Safety Act. This act requires that two members of the Board of Boiler Rules must be Registered Professional Engineers. At present there are three registered engineers on the board.

The difficulty of obtaining copies of the new roster of Professional Engineers was brought up by Dr. Wagner and the Executive Committee approved a resolution asking the Department of Registration and Education to furnish the secretary of each member society of I.E.C. with a roster.

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- potentiometer control
- pump-sequence control

etc., etc.

By F. A. ANNETT

Associate Editor, Power

381 pp., 369 illus., $5.50

Now you can understand the many electronic devices being used so widely in power and industrial plants—and do practical work with them. This book gives you in ABC fashion the fundamentals of electronics. From electron and photoelectric tubes, through electronic oscillators, to heating system controls, etc., it shows you the complete breakdown of each kind of device how it functions, the tubes and circuits used—just the material you need to hook up controls for particular jobs, see that they operate right, and keep them in good shape.

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Chaffey Student Chapter

Chaffey is always the first student group to contact headquarters after Sept. 1, and that's due, of course, to the club's efficient adviser, Arthur E. Flum. This year Alan Beggs will be president and Palmer House vice president. Bob Olson will serve as treasurer and David Eberly will plan the field trips. Anthony Matte will be recording secretary and Dwight French corresponding secretary.

"The fellows are eager for a successful year," writes Mr. Flum. "They have met at my home to plan the first semester activities. These begin with a drive for new members, and then follow plans for dinner meetings, speakers, field trips, a social event, and school service activities . . . a busy year!"

Leadership is important in any endeavor. Good leadership is what our Chaffey group has in abundance, and is the reason why the engineers are important figures on the campus. What Chaffey can do, other engineering clubs can do . . . with a leader, and there's so much fun and satisfaction in being a leader. Try it and see for yourself!

Your Social Security

The Federal Security Agency has given us the following release for publication:

"Every worker or self-employed man or woman should make a special effort to understand what Social Security neans to him and his family. There are two times when such action is very mportant, according to Mr. Thomas M. Galbreath, manager of the 79 East Adams Street, Chicago, office of the Social Security Administration.

"Because every individual's case is ikely to be different from any other he hould obtain information from his nearst Social Security office when he arives at age 65.

"The other important time for action s when a worker or self-employed peron dies. Someone in his family should ontact the Social Security office imnediately so there may be no loss of enefits to his surviving family."

PERSONALS

James A. Foster, senior engineer of the Highways and Municipal Bureau, Portland Cement Association, Chicago, has been appointed Assistant Manager of the Bureau effective Oct. 1, 1952, succeeding L. M. Arms, who was appointed bureau manager last July.

We were happy to have had a visit with Robert Taplin, of Long Beach, Calif., shortly after the Annual Meeting. He brought good reports of the Long Beach Chapter.

Arthur Richards, Executive Engineer, City of Larchmont, New York, was a visitor at headquarters during the month of September.

Dr. Gustav Egloff, Director Research, Universal Oil Products Company, Chicago, prepared an exceptionally interesting paper for presentation at the Seventh National Chemical Exposition, held in Chicago on Sept. 9. According to Dr. Egloff the oil industry offers unlimited opportunities to chemists and chemical engineers. As a result of its competitive vigor and researchmindedness, the petroleum industry is continually broadening its horizons, and with each new development the way is opened for many more.

Valuation Expert Retires

Dorr E. Field, a member of A.A.E. since January 1919, retired in 1952, after 34 years of railroading, 20 of them spent with the C. and G. Railway, Columbus, Miss.

Mr. Field began his railroad career with the Union Pacific in the valuation department and engineering assignments, right after he was graduated from Norwich University, Northfield, Vt., and most of his 14 years with that company was spent in Omaha, Nebr.

Mr. Field will continue his private practice in Columbus, Miss., where he is active in Boy Scout, civic, welfare and church work.

Book Reviews

The Book Department of the Association invites you to use its services when in the market for technical books and dictionaries. Save time—money—inconvenience

Communication of Technical Information, Robert M. Dederich. Chemonomics, Inc. $5.00.

The book concerns itself with these three questions: Why is the transfer of information necessary? Who can use the information? How will the information be used? The stress is on the thinking and logic which must underlie communication of technical information. A helpful text. 116 pp. Card-board covers.

Reclamation in the United States, Alfred R. Golze, Director of Programs and Finance, Bureau of Reclamation, U.S. McGraw-Hill Book Co. $8.00.

A comprehensive text on reclamation, providing material for college courses in engineering and economics, and serving as reference material for research or review of U.S. reclamation programs.

All recent advances in the field of water resource development in the western states have been covered. Interesting and helpful tables, charts and photographs are included.

Harmonics, Sidebands, and Transients in Communication Engineering, C. Louis Cuccia, M.S., Research Engineer, R.C.A. McGraw-Hill Book Co., Inc. $9.00.

Essentially two books in one, treating the field of the mathematics of harmonic and transient analysis applied to the communication field, and at the same time providing a treatment of communication engineering in its own right. Recent advances covered in this combined presentation of the academic and professional aspects of the communication engineering field include the fundamentals of television and FM transmission and reception, radar fundamentals, velocity-modulation-tube theory, transistors, etc.

Design and Use of Cutting Tools, Leo J. St. Clair, Cutting Tool Consultant. McGraw-Hill Book Co., Inc. $7.

A practical treatment of the many problems involved in selecting, designing, grinding, and using machine cutting tools. Written in shopman language, the book shows how to reduce wasteful tool breakage, cut down on tool inventory, while turning out better work. Many helpful hints, illustrations, charts and tables.

Automatic and Manual Control, A. Tustin, editor. Academic Press, Inc. $10.00.

Comprises the papers contributed to the Cranfield Conference on Automatic Control organized by the Department of Scientific and Industrial Research, together with the material presented during the discussions. The book provides a work of reference for those engaged in the design on control equipment.

Analysis of Alternating-Current Circuits, W. R. LePage, Prof. of Electrical Engrg., Syracuse University. McGraw-Hill Book Co., Inc. $6.50.

This introductory text in a-c circuits covers the usual ground of a first course and is completely devoted to the steady state in lumped linear networks. A logical and precise presentation of fundamentals. An excellent book.

Instrument Engineering, C. S. Draper, Head, Department of Aeronautical Engineering; W. McKay, Associate Prof., Aeronautical Engineering, and S. Lees, Associate Prof., Aeronautical Engineering, all of M.I.T. McGraw-Hill Book Co. $6.00.

Vol. 1 deals with the methods for describing the situations of instrument engineering, and develops a system of concepts, notations, diagrams and math-

matical forms for describing the per-
ɔrmance of physical devices and varia-
ons in physical quantities.

Vol. 2 is entitled Methods for Associ-
ting Mathematical Solutions with
ommon Forms and will be published
ı September.

Vol. 3 will be published in November
nder the title Applications of the In-
rument Engineering Method.

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lectric Machinery, A. E. Fitzgerald, Assoc. Prof., Electrical Engrg., M.I.T., and Charles Kingsley, Jr., Assoc. Prof., Electrical Engrg., M.I.T. McGraw-Hill Book Co. $8.50.

An integrated treatment of a-c and
-c machines for undergraduate ma-
inery courses in electrical engineer-
g. The text presents the theory in a
anner which highlights the basic prin-
ples common to all rotating electric
achines, as well as to a wide variety
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evices. The basic theory is then applied
d-c, synchronous, polyphase induc-
on, and single-phase machines, to-
ther with Amplidynes, Rototrols, and
lsyns. Specific applications of prin-
ples and methods of analysis are illus-
ated by a variety of examples.

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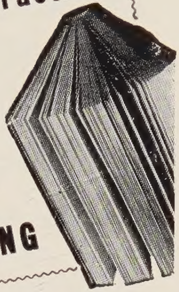
itish Planning and Nationalization, Ben W. Lewis, Prof., Economics, Oberlin College. The Twentieth Century Fund. $3.00.

Although the Labor Party was de-
ated in 1951, nationalization of large
gments of the British economy will
doubtedly remain. The author has
ought together some interesting data
d in his book presents a brief survey
the progress of nationalization up to
time of the change in government.
e book has a direct bearing on some
rrent American policies and proposals.

**ndbook of Engineering Fundamen-
als,** second edition. Ovid W. Eshbach.
ohn Wiley & Sons, Inc. $10.00.

n excellent reference book by an
standing author, covering the various
ses of engineering, revised and
ught up to date by re-written chap-



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ters on mathematics, thermodynamics, fluid mechanics, electricity, and engineering law. An extremely valuable book to both student and practicing engineer.

Basic Thermodynamics, Charles Leonard Brown, Assist. Prof., M. E., Purdue. McGraw-Hill Inc. $4.50.

Intended as a text for a one-semester course in thermodynamics with emphasis on mechanical applications, the book is designed to teach the first and second laws of thermodynamics and their application to the study of devices which convert heat into work or use work to transport heat. Formulas are reduced to a minimum. Jet propulsion is briefly covered.

Finite Deformation of an Elastic Solid, Francis D. Murnaghan, Inst., Tecnologico de Aeronautica, Brazil. John Wiley & Sons. $4.

The essential feature of the book is the consideration of squares and higher powers of the strain components in the theory of elacticity; that is, the assumption is not made that the deformation is so small that the squares and products of the strain components are negligible. Part of the material of the book was given in lectures at the Dublin Institute for advanced Studies.

Modern Pyrometry, Charles H. Cambbell, M.S., Met. Eng., Research Engr., Am. Steel and Wire Co., Chemical Publishing Co. $4.

Text was developed from a lecture prepared for the Cleveland Chapter, A.S. for M., designed to illustrate the relatively common as well as the new techniques in pyrometric practice and equipment in order to help those men who returned to industry, as well as to acquaint newcomers in metallurgy with the principles of and new developments in pyrometry. 150 pp. including index.

Build It Yourself. J. E. Tolman, Instructor, Furniture Making and Design, Adult Education Program, Chaffey College, Ontario, Calif. Prentice-Hall, Inc. $2.15.

Here's a "how-to-do-it" woodworking oject book that fills a definite need for text offering accurately dimensioned ojects with complete instructions. Just e book for the student and the home-orkshop hobbyist.

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anufacturing Processes, Myron L. Begeman, Prof., M.E., Univ. of Texas. 3rd ed. John Wiley and Sons. $6.

Written primarily for students and ofessionals engaged in production, in- strial, or tool engineering work. De- iled information is given on all e important manufacturing processes d machines now available, where they n best be applied, their advantages and awbacks, the tools required for each achine, and so on. First part of the ok is devoted to foundry practice, ttern work, plastic molding, powder etallurgy, hot and cold working of etals, heat treatment, and welding. uthentic, practical, well illustrated text.

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ansient Electric Currents, Hugh Hildreth Skilling, Prof. El. Engrg., Stanford University. 2nd ed. McGraw-Hill Book Co., Inc. $6.

With emphasis on basic principles, the xt treats the general methods of the lution of transient problems with any specific examples for the purpose preparing the student to attack with nfidence any sort of tranient problem. oblems have been added to the text. e of the major purposes of this new tion is to present the Laplace trans- mation method, and the author has vered the subject very well indeed.

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actical Industrial Electronics, F. A. Annett, Asociate Editor, Power. McGraw-Hill Book Co., Inc. $5.50.

A book written especially for operat- engineers and electricians con- nted with jobs in the installation, op- tion, and mintenance of electronic ipment, who have had little previous ning in the subject. The material is igned to ground the engineer and trician in the fundamentals—pro- es aid in working with the electronic ices they encounter.

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Vol. 1—Methods for Describing the Situations of Instrument Engineering

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W. McKAY S. LEES
Dept. of Aeronautical Engineering, MIT

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First of a 3-volume work giving a complete and unified study of the science of measurement and control, treating the subject as an established field of engineering. This volume develops a system of concepts, notations, diagrams, and mathematical forms for describing the performance of physical devices and variations in physical quantities. It provides a description of the physical circumstances under consideration by means of diagrams, mathematical forms, curves and numerical data.

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ANALYSIS OF ALTERNATING-CURRENT CIRCUITS

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Prof. of Electrical Engineering
Syracuse University

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Nomography and Empirical Equations, Lee H. Johnson, Tulane University. John Wiley & Sons. $3.75.

The purpose of the book is to explain two useful techniques for handling experimental and operational data: first nomographs, which provide quick, graphical answers where numerical data are substituted into formulas and secondly empirical equations—mathematical expressions of data plotted in the form of curves.

Aether and Electricity, History of the Theories of, Sir Edmund Whittaker, Honorary Fellow of Trinity College, Cambridge. Philosophical Libr. $12.

The first of two volumes on this subject. The author deals with the classical theories in his first volume. His volume prepared in 1910 has been rewritten and much new material has been added. The history will be continued to the present time in the second volume.

Asphalt Handbook, The Asphalt Institute, Construction Series No. 81.

An excellent handbook, giving the uses of asphalt, terms relating to asphalt, tests, modern paving equipment, design, manufacture and inspection of plant mixes; in fact, the entire field is well covered in this handy little book.

Tool Steel Handbook, Allegheny Ludlum Steel Corpn.

The aim of this handbook is to make available in compact form a picture of the Allegheny Ludlum tool steels, their properties and treatments as well as the special forms in which they are available. Many interesting charts and tables giving specific and comparative data on properties, analyses and applications are included. A list of mills, offices and warehouses will be found in the book.

D.C. Power Systems for Aircraft, R. H. Kaufmann, Application Engineer, Industrial Engrg. Div., General Electric Co. and H. J. Finison, Chairman, E. E. Research, Armour Research Foundation. John Wiley & Co. $5.

This book is based on both theoretic
analysis and comprehensive flight an
laboratory tests made by the autho
and their associates at General Electr
and at the Air Force Laboratories
Wright Field. A minimum of math
used in developing operating theory; i
stead the authors rely on performan
data from actual flight tests to discove
and point out the basic performan
qualities of d.c. power system. Profusel
illustrated. 206 pp.

Inspection and Gaging, by C. W. Ke
nedy, Quality Control Engineer, Fe
eral Products Corpn. The Industri
Press. $7.50.

A training manual and referen
work that discusses the place of inspe
tion in industry, describes the types
automatic and manual gaging and mea
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shows the proper techniques of using
spection equipment; and outlines
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Introduction to Servomechanisms,
Porter, M.Sc., Ph.D., Head, Resear
Dept., Ferranti Electric Ltd., Toron
Canada. John Wiley & Sons. $1.75.

A Methuen Monograph, not intend
for the student who wishes to speciali
in the theory and design of automa
control systems and servomechanism
but rather for the physicist, physiolog
or engineer who is merely interested
the subject.

Modern Methods of Materials Handlin
by The Material Handling Institut
Inc. Prentice-Hall, Inc. $5.50.

A book to answer your material ha
dling problems; to show how to analy
and solve problems arising from mat
rial handling in industry, and to provi
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